

PHYSICS

Annihilation of Matter

Antiproton from outer space, with incredibly high energy of 10,000,000,000 electron volts, produces a pure photon shower in a most unusual cosmic ray event.

➤ ANNIHILATION OF matter seems to have been observed in a great burst of cosmic ray energy.

Prof. Marcel Schein and colleagues of the University of Chicago's department of physics have reported discovering the first case of an extraordinary "pure photon shower" in cosmic rays at 100,000 feet altitude.

Since no charged particles were observed, Prof. Schein assumes that it is due to an annihilation process of an antiproton from outer space with the incredibly high energy of more than ten million billion electron volts (10^{16} ev.)

This kind of happening is quite novel. Nothing like it has been reported before. The energy is higher than anything that has been seen directly. Scientists have never been sure they have observed an antiproton, which is the opposite of the very common proton, or hydrogen heart.

The new "event" was recorded in a little stack of photographic film (pellicles) flown in a Skyhook balloon from Goodfellow Air Force Base, Texas, over 19 miles up.

There were about 21 photons unaccompanied by any charged particles, and their tracks were contained in a very narrow volume. Energies were from less than 1,000,000,000 electron volts to over 20,000,000,000 electron volts.

While no process known to the scientists at the present time seems to explain all the features of the remarkable event, they sug-

gest "that it may have been produced by an annihilation process in flight at very high energy."

The antiparticle, or negative proton, that caused the commotion was probably not produced in the atmosphere, but came from outside. A theory put forth in 1950 by Dr. Enrico Fermi, also of the University of Chicago, predicted the production of such antiparticles of such immense energies by cosmic rays outside the atmosphere of the earth.

The research by Prof. Schein with D. M. Haskin and R. G. Glasser was part of a joint program of the Office of Naval Research and the U. S. Atomic Energy Commission.

Prof. Schein and his group are continuing their measurements and expect to have more details to report later. Meanwhile they, as well as other cosmic ray investigators, will be alert to discover more such happenings in their future experiments.

Science News Letter, July 17, 1954

Science on Verge of New Release of Great Energy

➤ SCIENCE SEEMS to be on the verge of new discoveries that may rival the release of atomic energy.

There is the possibility of obtaining vast amounts of energy from the annihilation

of matter. This would be an achievement that, when controlled, would outdistance the H-bomb itself.

The actual annihilation of matter seems to have been signaled in the burst of cosmic ray energy discovered by Prof. Marcel Schein and his colleagues.

Prof. Schein has concluded that this extraordinary event was the actual annihilation of "antimatter," an antiproton that came in from outer space with this incredibly high energy.

This is extremely big news for science. The antiproton, or negative proton, has been theoretically foreseen. If an antiproton were to combine with a proton, heart of a hydrogen atom, 2,000,000,000 electron volts of energy would be let loose. This is a thousand times as much as the energy release of the destruction of an electron.

Such possibilities are the reasons for the intensive study of cosmic rays and the building of powerful atomic particle accelerators that duplicate some of the cosmic rays.

In the exploration of atomic particles lies the possibility of understanding the constitution of the atomic nucleus, or heart of matter, and the immense reactions that take place in such short intervals of time among the minute particles.

Science News Letter, July 17, 1954

ANIMAL NUTRITION

Sex Hormone in Feed Fattens Steers Faster

➤ VERY SMALL amounts of a synthetic female hormone chemical added to the feed of fattening steers produce gains as much as 35% in weight and savings of 20% in feed costs, a research team from the Iowa Agricultural Experiment Station report in *Science* (July 9).

This method of adding to meat production is an extension of experiments that showed that putting pellets of diethylstilbestrol under the skin of cattle would fatten them.

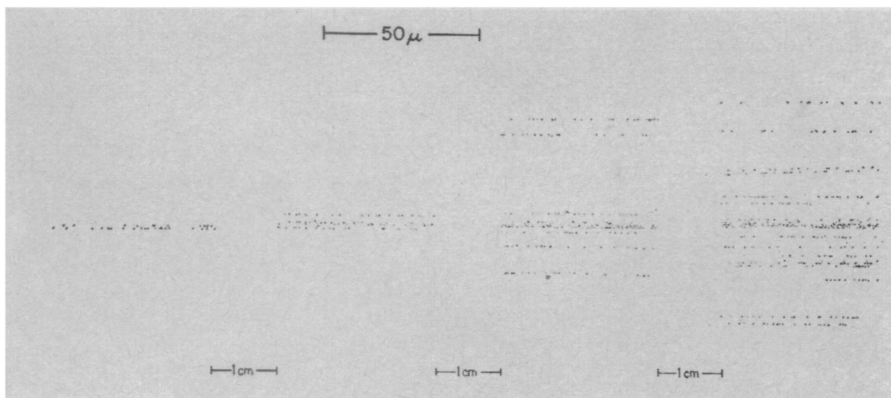
The addition of the chemical to the soybean-oil meal in the ration gets away from a human health hazard that would result if residues of the chemical remained in the meat of the cattle at time of slaughter.

Diethylstilbestrol is used medically in treating sexually underdeveloped women. It is also used in chemical caponizing of chickens, and some years ago, chicken heads fed to mink resulted in losses to the fur raisers due to accidental sterility in the mink caused by some of the chemical left in the chicken heads.

The chemical added to the steer ration amounts to the extremely small amount of five milligrams a day per steer, and this does not remain in the animal or affect the meat. No reduction in the fatness of the cattle or the quality of the meat occurred in the chemically treated animals compared with controls.

The Iowa scientists were Wise Burroughs, C. C. Culbertson, Joseph Kastelic, Edmund Cheng and W. H. Hale.

Science News Letter, July 17, 1954



ANTIPROTON TRACK?—*The annihilation of matter is seen in the most unusual cosmic ray event from which came the paired electron tracks reproduced here. The extremely small angle of spread shows the very remarkable character of the pure photon shower. The event actually started before entering the side of a stack of photographic emulsions, flown for six hours at over 100,000 feet, at a zenith angle of 66 degrees, and the tracks passed through 14 of the 18 pellicles. The photograph shows small sections, taken at arbitrary intervals along the tracks resulting from this unique event, the first of its kind.*